

himself in connection with the conductor of the machine.] Now I am electrified; I can feel my hair rising up, as the paper tassel did just now. Let us see whether I can succeed in lighting gas by touching the jet with my finger. [The lecturer brought his finger near a jet from which gas was issuing, when, after one or two attempts, the spark which came from his finger to the jet set fire to the gas.] You now see how it is that this power of electricity can be transferred from the matter in which it is generated and conducted along wires and other bodies, and thus be made to serve new purposes, utterly unattainable by the powers we have spoken of on previous days; and you will not now be at a loss to bring this power of electricity into comparison with those which we have previously examined, and tomorrow we shall be able to go farther into the consideration of these transferable powers.

THE WAY FLORIDA WAS FORMED.

Considering that the naturalist of the present day finds the results of his predecessors' labors recorded in books, where he can acquire them in a small fraction of the time required by the original investigators to learn them from nature, it is probable that Louis Agassiz knows more about the plants and animals of the globe than any other person that ever lived. He has made a special study of the coral insects. We have read a very interesting account of the care with which he watched over some of the little worms which he had in his own room, for the purpose of observing their habits. Professor Agassiz is remarkable among geologists for his extreme caution in coming to conclusions. At the meeting of the American Association for the Advancement of Science, last summer, at Newport, R. I., his most earnest remarks were protests against drawing any inferences except those which follow by absolute necessity from the observed facts. This temper of mind, combined with his large acquirements, gives great weight to his assertions. Now, Agassiz says that the same kind of insects that are at this time forming the coral reefs of Florida, built up Florida, and that thousands of centuries must have been consumed in the process.

ARSENICAL WATERS.—A stream called Whitbeck, in England, rising in the Blackcombe mountains, in West Cumberland, contain arsenic in a determinable quantity. The arsenic is most probably derived from veins of arsenical cobalt ore, through which it percolates, for a few yards above the source there is the entrance of a mine which is very rich in arsenical ore. The arsenical water is habitually used for every purpose by the inhabitants of the little village of Whitbeck, and with beneficial results so apparent that one might be justified in paradoxically characterizing it as a very wholesome poison, the deadly elements in dilution being productive of the most sanitary effects. Ducks will not live if confined to the Whitbeck, and while trout abound in all the neighboring rivulets, no fins are ever found in the arsenicated stream. But its use by the villagers does not give rise to any symptoms of arsenical poisoning, but rather to the effects which are observed in Styria, among the arsenic-eaters there. When the railway was being carried past Whitbeck, the first use of the water produced the usual marked effects on the throats of the men employed on the works. The soreness of mouth, from which they at first suffered, soon, however, disappeared. The children of Whitbeck are celebrated for rosy cheeks, and many of the villagers live to a great age.

EXPLOSIONS.—We regret to notice the frequency of boiler explosions recently. On the 2d inst., the steamboat *H. M. Hill* exploded her boilers a short distance below Baton Rouge, on the Mississippi river, by which thirty-nine persons were killed and twenty wounded. A boiler in the coach factory of Dann & Brothers, New Haven, Conn., exploded on the 1st inst., by which one boy was killed and the building demolished. The towboat *Baltic* exploded her boilers in Mobile bay on the 3d inst., by which several persons (exact number unknown) were killed and wounded.

A correspondent of the *Maine Farmer* states that grass seed should always be sown in the Fall, and not in the Spring, as is practised by most farmers.

SOMETHING NEW ABOUT GOLD—A NEW METAL.

At a late meeting of the Manchester (England) Geological Society, an interesting paper was read by T. A. Readwin, Esq., on gold discoveries which had been made by him in Merionethshire, Wales, and he exhibited numerous rich specimens of ore taken from it. He stated that Sir R. Murchison had laid it down that "the most usual position of gold is in veinstones that traverse altered paleozoic slates frequently near their junction with eruptive rocks, whether of igneous or aqueous origin." This statement was remarkably corroborated by the position of the quartzose vein in Wales, which traversed altered paleozoic slates near the junction of an eruptive bar of porphyritic greenstone. The same law was found to hold good in all the gold-bearing quartzose veins of Wales. Several shoots and bunches of gold were found in one mine. In one instance, 100 pounds of goldstone yielded 14½ ounces of fine gold. Lately, operations were commenced to mine the quartz upon what is called "St. David's lode." Of the rock which had been raised and broken, many stones were found very rich in gold and sulphides of copper, and there was another mineral which had been termed *white metal*, that had been examined by several mineralogists, none of whom knew what it was, an ignorance which was shared in by the members of the association after much examination. Cubes of this white metal were found in cubes of gold, and *vice versa*; and wherever it was found, it was a sure indication that gold was there also.

Mr. Readwin, in his paper, asserted that at a certain temperature gold would volatilize and escape mechanically, though such was not the general belief. Mr. Atkinson, a member, stated that gold was sublimated from the earth by internal heat.

NEW FUSIBLE METAL—CADMIUM.

Under this title, the New York *World* states that "Dr. B. Wood, of Nashville, has discovered a valuable alloy which fuses at 120° Fah.—a lower temperature than the fusing point of any metal previously known. It is especially adapted for light castings, and is composed of from one to two parts of cadmium, from seven to eight parts of bismuth, two of tin and four of lead. By the addition of mercury, the fusing point may be lowered to almost any extent without impairing the tenacity of the metal."

The old fusible alloy of bismuth, lead and tin melts at 197° Fah.; the cadmium in the above is stated to give it superior fusible qualities. When mercury is employed to render metals fusible, the compound becomes an amalgam, and not an alloy; and in every instance it impairs the tenacity of the metals. This is quite different from the opinion quoted above.

Cadmium is a metal which is but little known in the general arts, and there are comparatively few persons who have seen it. It is white in appearance, like tin—very ductile and malleable. It fuses considerably under a red heat, and is nearly as volatile as mercury. It is found in minute quantities associated with zinc; and in the distillation of zinc ores it comes over among the first products, owing to its great volatility. Cadmium forms several definite alloys; it unites with platinum and copper at a red heat. It is soluble in the powerful acids, especially nitric.

FALLING OF A GRIST MILL.—On the morning of the 3d inst., a portion of the Mount Vernon Mills, at Troy, N. Y., fell outward under a heavy load of 100,000 bushels of grain, about half of which was scattered among the ruins. The mill was only erected last winter, but good builders had pronounced it unsafe. The loss is \$5,000, which might have been obviated by the previous outlay of \$500 in the erection of stronger walls.

SAWING FEATS.—Referring to the great feat of sawing described on page 117 of the present volume of the *SCIENTIFIC AMERICAN*, Mr. Sturett A. Baird, of Marshall, Texas, informs us that the sawing of 1,000 feet per hour is held to be good work for the pine of that region. This he can do without leaving the mark of a tooth upon it. Southern pine is more close in the grain and more difficult to saw than the pine of the North.

A GREAT MACHINE FOR A SIMPLE PURPOSE—TURNING BAGS BY STEAM.

We have recently examined a machine more complicated than a stocking loom for the simple purpose of turning cloth bags (after they have been sewed or woven) the right side out! "Can it be," we asked the inventor, "that there is a demand for machinery for performing so trifling an operation as this?"

"Oh, yes," he said, "it takes as much time to turn a bag as it does to make it, at the present day. In our neighborhood there are two large cotton manufactories devoted exclusively to making cloth for bags. In the country there are probably three hundred bag manufacturers, employing from two to fifty turners each, and one of these machines will do the work of thirty hands. One of the large manufacturers in this city told me that the machine, besides saving in wages, would enable him to effect considerable economy in his rent, from the small room occupied by the machine in comparison with all the hands he now employs for turning."

The machine works in the most accurate, rapid and beautiful manner, but it would be difficult to give any clear idea of its ingenious mechanism without diagrams. An application for a patent for the invention has been made through the Scientific American Patent Agency, and probably our readers will hear more of it at some future time.

HOW TO SWIM IN A SURF.—At a late meeting of the Chicago Academy of Sciences, one of the members, in the course of a discussion, gave the following very useful information for persons who may be shipwrecked or who happen to fall overboard at sea:—"The person must maintain such a position as to see the waves as they approach. All that is required, then, is that the swimmer keep his course, watching their approach. As he rises upon a wave, he will see a roaring cataract three or four feet high rushing toward him as though it threatened destruction; but if he holds his breath a moment, the crest will pass harmless over him, and in an instant he will find himself on the windward slope of the wave, perfectly safe and ready to continue as before. If the person is floating upon a board or plank, he should turn his head toward the coming waves and keep his float at right angles to them, holding his breath as before when the crests pass. In this way he will be safely driven to the beach; but if he allows the board to be struck by the waves sidewise, he may be rolled over and over, and, in his fright, let go his hold."

FROM some very interesting experiments made by Professor L. Vella, of Turin, we are led to conclude that the poison *curare* is an antidote to strychnine. That a mixture of these two deadly poisons so far from increasing in virulence becomes innocuous, and may be administered to animals with impunity. Signor Vella was led to try this experiment by considering the property possessed by *curare* of paralyzing the motor nerves, and to apply it to the cure of tetanus, a disorder essentially convulsive. *Curare* completely destroys the effects of a dose of strychnine, which is mortal when administered either by the stomach, or by injection, or injected into the veins. In a physiological point of view this fact is important, for it serves as a scientific basis to all the applications of *curare* that can be made in therapeutics.

CONVERTING WAR SHIPS INTO STEAMERS.—The Board appointed by the Secretary of the Navy to examine what ships of the navy may be converted into steamers report that they have found it inexpedient, owing to their small capacity and various other considerations, to recommend any but the following line-of-battle ships: *Pennsylvania*, *Columbus*, *Ohio*, *North Carolina*, *Alabama*, *Virginia* and *New York*. The other two—the *Delaware* and *New Orleans*—are unfit, both in frame and planking, for this alteration. The entire cost of converting these ships, according to their estimate, will be about \$3,064,000.

THE cultivation of the silk worm is said to be a complete success in California. Specimens of cocoons, floss and twisted silk were exhibited at the late Mechanics' Fair in San Francisco. California is yet destined to become a great wine and silk-producing State.